

(12) INTERNATIONAL PUBLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
17 July 2003 (17.07.2003)

PCT

(10) International Publication Number  
**WO 03/058309 A1**

(51) International Patent Classification<sup>7</sup>: **G02B 6/16**

(21) International Application Number: PCT/GB03/00066

(22) International Filing Date: 10 January 2003 (10.01.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
0200603.9 11 January 2002 (11.01.2002) GB  
0207240.3 27 March 2002 (27.03.2002) GB  
0210933.8 13 May 2002 (13.05.2002) GB

(71) Applicant (for all designated States except US):  
**BLAZEPHOTONICS LIMITED** [GB/GB]; Finance  
Office, University of Bath, The Avenue, Claverton Down,  
Bath BA2 7AY (GB).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **KNIGHT,**  
**Jonathan, Cave** [GB/GB]; Canteen Cottage, Canteen  
Lane, Wellow, Bath BA2 8PY (GB). **BIRKS, Timothy,**

Adam [GB/GB]; 14 Horsecombe Brow, Combe Down,  
Bath BA2 5QY (GB). **RUSSELL, Philip, St. John**  
[GB/GB]; Shepherd's Mead, Southstoke, Bath BA2 7EB  
(GB). **MANGAN, Brian, Joseph** [GB/GB]; Flat 5, 41  
Grosvenor Place, Bath BA1 6BA (GB).

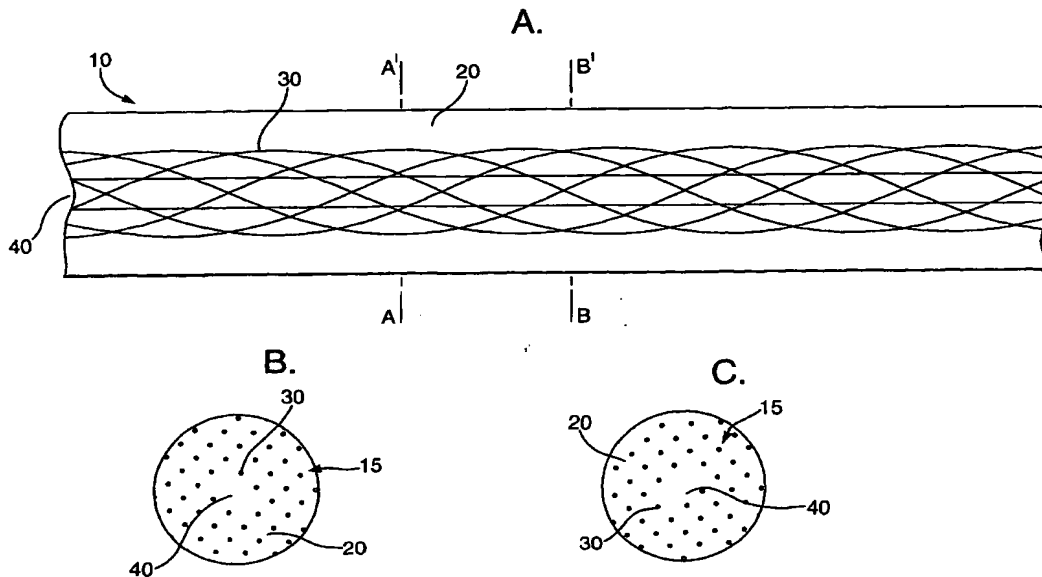
(74) Agents: **CRITTEN, Matthew, Peter et al.**; Abel & Imray,  
20 Red Lion Street, London WC1R 4PQ (GB).

(81) Designated States (national): AE, AG, AL, AM, AT, AU,  
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,  
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,  
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,  
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,  
MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE,  
SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ,  
VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM,  
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),  
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),  
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,  
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI,  
SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN,  
GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: A METHOD AND APPARATUS RELATING TO MICROSTRUCTURED OPTICAL FIBRES



(57) Abstract: A microstructured optical fibre (10) comprises a core region (40) and a cladding region (15). The cladding region (15) comprising a plurality of structures (30), which have a first refractive index and are embedded in a solid matrix material (20) having a second, different, refractive index. The structures (30) are helical along the fibre (10).

WO 03/058309 A1

**Published:**

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

## INTERNATIONAL SEARCH REPORT

International Application No.

PCT/G3/00066

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 G02B6/16

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G02B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

INSPEC, EPO-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	LIBORI S B ET AL: "High-birefringent photonic crystal fiber" OPTICAL FIBER COMMUNICATION CONFERENCE. (OFC). TECHNICAL DIGEST POSTCONFERENCE EDITION. ANAHEIM, CA, MARCH 17 - 22, 2001, TRENDS IN OPTICS AND PHOTONICS SERIES. TOPS. VOLUME 54, WASHINGTON, WA: OSA, US, vol. 1 OF 4, 17 March 2001 (2001-03-17), pages TuM2-1-TuM2-3, XP010545786 ISBN: 1-55752-655-9 abstract ---	1-7, 13-16, 19,20
Y	EP 0 227 366 A (UNIV SOUTHAMPTON) 1 July 1987 (1987-07-01)  abstract; figure 2 --- -/--	1-7, 13-16, 19,20

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

## \* Special categories of cited documents:

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \*G\* document member of the same patent family

Date of the actual completion of the international search

17 June 2003

Date of mailing of the international search report

27/06/2003

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Jakober, F

# INTERNATIONAL SEARCH REPORT

International Publication No

PCT/GB93/00066

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>WO 00 49436 A (UNIV BATH ;BIRKS TIMOTHY ADAM (GB); KNIGHT JONATHAN CAVE (GB); RUS) 24 August 2000 (2000-08-24) cited in the application abstract</p> <p>-----</p>	1-20

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Publication No

PCT/G 3/00066

Patent document cited in search report		Publication date		Patent family member(s)		Publication date
EP 0227366	A	01-07-1987	EP	0227366 A2		01-07-1987
WO 0049436	A	24-08-2000	AU	2564900 A		04-09-2000
			AU	2565000 A		04-09-2000
			CA	2362992 A1		24-08-2000
			CA	2362997 A1		24-08-2000
			CN	1341219 T		20-03-2002
			CN	1341221 T		20-03-2002
			EP	1153324 A1		14-11-2001
			EP	1153325 A1		14-11-2001
			WO	0049435 A1		24-08-2000
			WO	0049436 A1		24-08-2000
			JP	2002537574 A		05-11-2002
			JP	2002537575 A		05-11-2002